

# A teaching skills assessment tool inspired by the Calgary–Cambridge model and the patient-centered approach



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## ABSTRACT

**Objective:** The aim of this study was to develop a descriptive tool for peer review of clinical teaching skills. Two analogies framed our research: (1) between the patient-centered and the learner-centered approach; (2) between the structures of clinical encounters (Calgary–Cambridge communication model) and teaching sessions.

**Method:** During the course of one year, each step of the action research was carried out in collaboration with twelve clinical teachers from an outpatient general internal medicine clinic and with three experts in medical education. The content validation consisted of a literature review, expert opinion and the participatory research process. Interrater reliability was evaluated by three clinical teachers coding thirty audiotaped standardized learner–teacher interactions.

**Results:** This tool contains sixteen items covering the process and content of clinical supervisions. Descriptors define the expected teaching behaviors for three levels of competence. Interrater reliability was significant for eleven items (Kendall's coefficient  $p < 0.05$ ).

**Conclusion:** This peer assessment tool has high reliability and can be used to facilitate the acquisition of teaching skills.

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## 1. Introduction

It is widely recognized that effective clinicians are not automatically effective teachers and that faculty development is necessary to train teaching competencies [1–3]. Most universities have implemented faculty development programs following the recommended guidelines for training effective teachers [4–8].

### 1.1. The clinical teaching skills

The different roles of a good clinical teacher have been well described. Skeff et al. [9] described seven components for the «Stanford Faculty Development Program» (SFDP: a collection of seminars in clinical teaching): (1) the establishment of a positive learning climate; (2) control of the teaching session; (3) the communication of goals; (4) the enhancement of understanding and retention of information; (5) evaluation; (6) feedback; and (7) self-directed learning. Irby identified the domains of knowledge that a clinical teacher should master: clinical knowledge; knowledge of the patients and of the clinical context; the learner's knowledge; general teaching principles and the principles of teaching problem-based scripts [10]. Hesketh suggested a conceptual framework consisting of three levels of competence illustrated by circles expressing the educational outcomes (performance of tasks, approach to tasks and professionalism) [11]. Within these three levels of competence, twelve roles have been defined and thoroughly described for clinical

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teachers [12–14]. Sutkin reviewed the literature for the required skills of a good clinical teacher in 2007 and identified five major themes: medical knowledge; technical skills and clinical reasoning abilities; interrelational skills; communicational skills and enthusiasm for clinical work and for teaching itself [15]. More recently, Srinivasan et al. published a new literature review and survey among expert clinical teachers. Their work classifies the different skills the clinical teacher needs into six categories: medical knowledge; a learner-centered approach; communication and interrelational skills; professionalism and role modeling; a practice-based reflexion and use of learning promoting

resources [16]. Recent other studies asking learners about the important teaching skills have confirmed these categories [17,18].

All the above-mentioned authors agreed on the necessity to have good clinical knowledge and some specific teaching skills as well as knowledge related to theoretical aspects of teaching, and communication and interrelational abilities. In particular Harden and Srinivasan added professionalism and personal development as necessary dimensions of a clinical teacher's expertise [11,16]. Therefore, we considered it important to add a reflective and formative approach to other predefined dimensions of teaching skills.

<b>Teacher's skills</b>	<b><u>Patient-centered education</u></b> <b>The physician as trainer</b> <b>for the patient</b>	<b><u>Learner-centered teaching</u></b> <b>The clinical teacher as trainer</b> <b>for the resident</b>
-to define and to answer the learner's needs	The physician defines the patient's needs and answers the patient's needs (specific treatment needs, fears, lack of knowledge, need of support, etc.)	The clinical teacher defines the learner's needs (previous knowledge, learning objectives) and answers to these needs
-to develop the relationship	The physician establishes a therapeutic relationship using empathy, integrity, respect and being patient centered (valuing his needs, expectations, fears, emotions).	The clinical teacher establishes a relationship in a learning climate using empathy, integrity, respect and being learner centered (valuing his needs, expectations, fears, emotions).
-to guide the learning process	The physician favors patient's autonomy that enhances his own management of illness	The clinical teacher favours learner's activity and autonomy that enables him to manage his own learning plan and to practice independently
-to be empathetic	The physician takes into account the patient's emotions and psychosocial distress	The clinical teacher takes into account the learner's emotions and psychosocial distress
-to check the understanding and the relevance of learned topic	The physician checks the patient's understanding of the illness, the treatment, the procedures, etc	The clinical teacher checks the learner's understanding of clinical reasoning, choice of treatment etc
-to check the retention and acquired knowledge	The physician checks the retention of new information, explanation, etc,	The clinical teacher checks the retention of new concepts, clinical reasoning, capacity to transfer knowledge to new context etc.
-to anticipate further learning and evaluation of next steps to reach	The physician anticipates with the patient the next steps and the way to evaluate the application of new concepts	The clinical teacher anticipates the further learning goals and their evaluation

<b>centeredness in clinical teaching sessions (free adaptation according to Gagnayre et d'Ivernois<sup>37</sup>)</b> <b>Learner's skills</b>	<b><u>Patient-centered education</u></b> <b>The patient as learner</b>	<b><u>Learner-centered teaching</u></b> <b>The resident as learner</b>
-to express needs	To express needs in care, investigations, knowledge, values, roles, etc	To express learning needs, needs of support, etc
-to understand, to be able to explain	To understand the body, the illness. To be able to explain the psychosocial repercussions and the principles of treatment, etc	To understand the illness, the physiopathology. To be able to explain the psychosocial repercussions and the principles of treatment, etc
-to detect, to analyse, to measure	To detect symptoms of gravity. To measure values (blood glycaemia, blood pressure, etc).	To detect symptoms of gravity. To measure values (blood glycaemia, blood pressure, etc). To analyse clinical signs
-to face, to decide	To know and apply strategies in case of a crisis (asthma attack, hyperglycaemia, etc,	To know and apply treatment strategies for a patient's crises (asthma attack, hyperglycaemia etc)
-to solve a problem of daily care	Adjust the treatment to specific context	Adjust the treatment to specific context and environment
-to practice, to do	To practice technical skills (insulin injections, glycaemic control, peak flow measure, inhalers, etc)	To practice technical skills, (insulin injections, glycaemic control, peak flow measure, inhalers, etc)
-to adapt, to adjust	Adapt the treatment to new life conditions (journey, pregnancy, sport, etc.)	Adapt the patient's treatment' to new life conditions (journey, pregnancy, sport, etc)
-to use available resources	To know when a consultation is needed and whom to contact ; to find useful information, to make use of local resources (groups, etc)	To know whom to call in case of difficulty, find useful information in literature or in practical guidelines

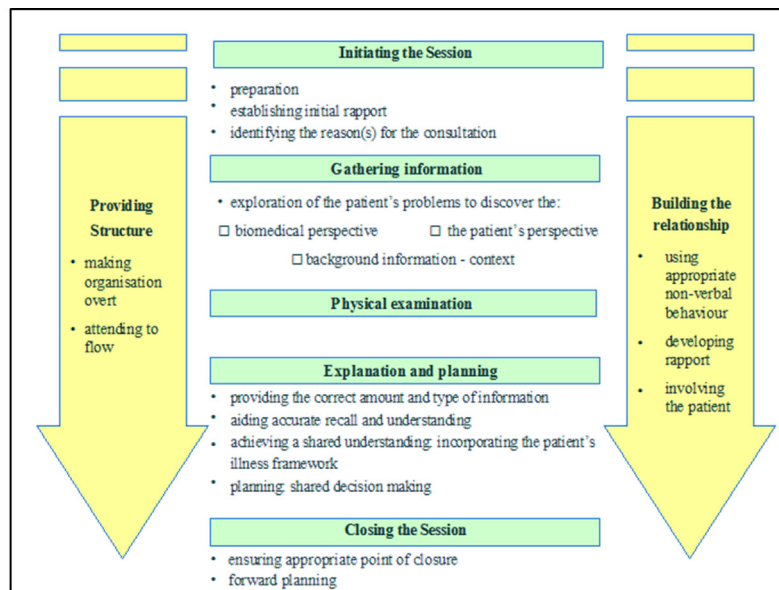
**Fig. 1.** Parallel between patient-centeredness in patient education and learner-centeredness in clinical teaching sessions.

### 1.2. The assessment of teaching skills

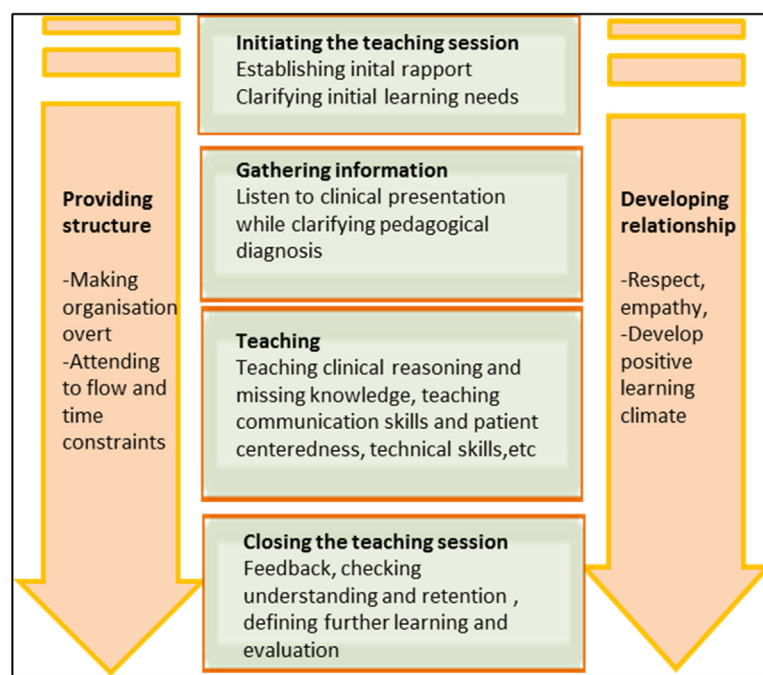
The above-mentioned faculty development programs are only effective if the transfer of training is promoted. Three major factors assist in the transfer of skills into practice: learner's characteristics (e.g., motivation), the format of the learning session (e.g., interactive and practical) and the work environment (e.g., further supervision in practice) [19,20]. Guidelines have been developed for this purpose: the participants should be able to apply the learned concepts, they must be motivated to do so,

and they need support in their working environment [21]. Thus the effectiveness of faculty development programs should be assessed with the use of validated instruments, and time and resources should be available for that [22,23]. Guidelines have been defined, stressing the need for assessment of clinical teachers by different sources and methods using validated and accepted instruments [24–26].

Different methods and tools for assessing clinical teaching skills exist: some are completed by the learners, some are self-evaluations, and others are filled in by peers.



Calgary-Cambridge framework for the clinical encounter



Adapted clinical teaching session framework according to the Calgary-Cambridge framework

**Fig. 2.** parallel between a clinical encounter and a clinical teaching session: the Calgary–Cambridge framework and an adapted framework for the teaching session.

<b>Providing structure</b> -to make a program -to structure the learning session in logical sequence -to use structuring tools (signposting, summarizing, etc) -to attend to time constraints and keeping learning session on task	<b>Initiating the clinical teaching session</b> -to welcome the learner -to clarify the learner initial learning needs and to define an objective	<b>Developing the relationship</b> -to develop a positive learning climate -to express empathy and support to the learner
	<b>Clinical teaching</b> -to define previous knowledge of learner -to teach interactively according to the learner's needs (clinical reasoning, medical knowledge, technical skills, communicational and interrelational skills, etc) -to promote understanding and retention of new information -to help transfer of knowledge to new context/situation -to teach dealing of uncertainty	
	<b>Closing the clinical teaching session</b> -to give balanced feed-back (positive and suggestions for improvement) -to check new acquired knowledge -to define further learning goals and future evaluations -to question his own way of teaching by asking commentary to the learner	

Fig. 3. List of clinical teacher's tasks for a clinical supervision session (according to the Calgary–Cambridge framework).

Most of them consist of an assessment of student's or resident's satisfaction with teaching skills using Likert scales. All these tools allow the clinical trainer to receive a ranking on a subjective scale but do not give clear suggestions for improvement. The tools help to define what has to be improved but not how to do it [24,27–31]. Furthermore it has been shown that learners over evaluate their teachers and the validity of learners' evaluations has been questioned [32].

Self-evaluation is not more reliable as poor performers tend to overestimate their competence and good performers often underestimate their skills [33,34].

Another way to assess faculty development programs is to use formative feedback based on objective observation. It is well recognized that feedback on the teaching skills and their evaluation is an effective way to enhance transfer to practice [35–37]. Analysing the verbatim of a clinical supervision session provides interesting information but is very time and resource consuming, limiting its practical use [38].

Peer observation is an important and recognized method of feedback on clinical teaching skills. Its use has been recommended for assessment of faculty development programs [7,39]. Gosling described three models of peer observation of teaching: an evaluation model, usually with a senior faculty member as observer; a developmental model with an expert teacher as observer; and a peer-review or collaborative model [40]. While the first two models mainly focus on identifying underperformance, demonstrating or confirming competency, the essence of the peer review model is that teachers observe each other, often in a reciprocal process, in a way that stimulates improvement through dialog and self reflection [41].

Thus, this model may also help encourage local faculty development programs, by promoting a culture in which teaching is valued and discussed. In doing so, it is also beneficial to the observer and improves his/her own teaching skills, prevents the bias of the learner's evaluation, and reduces the fear of being judged by a superior [29,39,40,42–44].

Different models of instruments used for peer review exist: most of them are checklists of teaching skills based on Likert scales; some are free expressions of experts giving suggestions for improvement during a feedback session [24,43,45–48]. These tools have been validated and are mainly easy to use. Their weakness is nevertheless the subjective character of the Likert scale and the lack of concrete suggestions for improvement. This lack of objectivity and relevance of the commentaries increases the fear of being judged, especially when the tool is used in a summative more than formative way [39,49].

In summary, several studies have expressed the need to evaluate teaching skills. Recent evidence suggests that peer review in specific conditions can enhance the acquisition of these skills but the lack of assessment tools adapted to the clinical teaching session and containing concrete suggestions for improvement added to objective criteria, has been reported.

The aim of this study was to develop and validate such a descriptive tool for peer review, which covers the different recognized domains of clinical teaching skills. We included all concerned players in the elaboration, implementation and evaluation of the tool so as to facilitate its future use.

## 2. Method

### 2.1. Conceptual framework

In clinical practice, and specifically in an outpatient context, patient-centeredness and effective communication skills are of prime importance for good clinical practice [50,51].

### 2.2. The process of a patient-centered approach/patient education, compared to a learner-centered approach

Looking at patient centeredness and the principles of patient education [52,53], and as described earlier by Marvel [54], we found a clear parallel between this approach and the learner

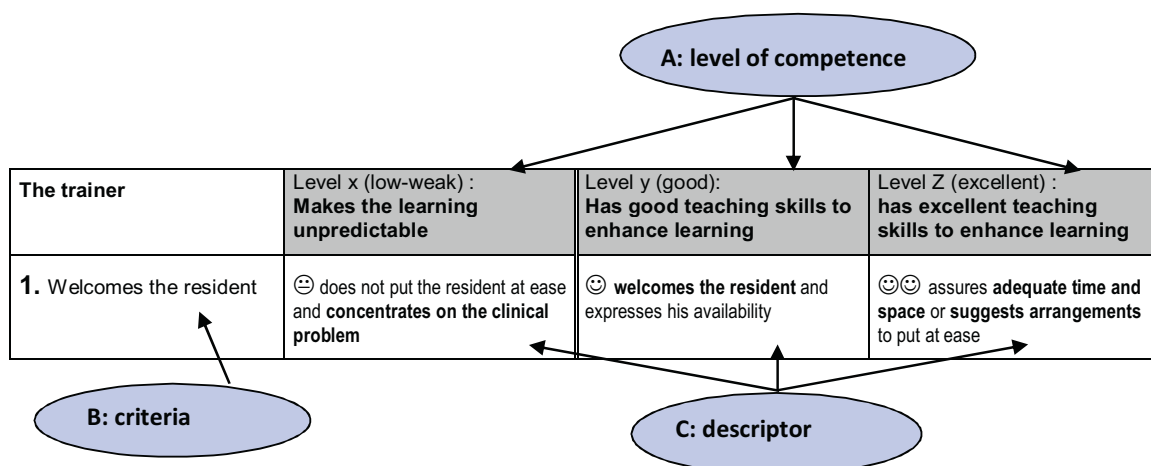


Fig. 4. structure of a formative rubric (extract of the developed instrument).

centeredness required in an effective clinical teaching session [55], as shown in Fig. 1.

### 2.3. The structure of the clinical encounter compared to the structure of a clinical teaching session

The Calgary–Cambridge guide to the medical interview is one of the foremost communication models used in healthcare education [50,56,57]. As shown in Fig. 2, there is a clear parallel between the clinical and the teaching sessions. The physician controls the encounter by developing the relationship with the patient and by providing structure to the encounter; for this purpose he follows a clear structure (initiating the session, gathering information, physical examination, explanation and planning, and closing the session). Similarly the clinical teacher controls the teaching session by developing a relationship with the learner in a learning environment; he also uses a clear structure (initiating the session, gathering information, teaching interactively and explaining aspects, and then closing the session) (see Fig. 2).

Previous research has demonstrated that skills are best retained when they are translated from one area to another [58,59]. In that respect, we hypothesized that emphasizing the similarities between these processes would be enlightening and could facilitate the transfer of competencies from a role that clinicians are very familiar with to another, thereby also promoting a sense of mastery of their teaching tasks.

### 2.4. Research design

Our research is situated in a socio-constructivist paradigm where the learning is based on collaborative actions and reflection on action [60]: we used iterative processes with clinical teachers and pedagogical experts involved at each step to co-construct the tool. We developed this descriptive formative tool using an action research framework. Action research consists of an action, its evaluation and critical reflection that promotes changes and continuous improvement in practice [61]. Its strength lies in its ability to empower participants, in our context the clinical teachers, by enabling them to engage with the research and subsequent implementation activities.

### 2.5. Context and participants

The study was conducted in the general internal medicine outpatient clinic at the University Hospitals of Geneva,

Switzerland. Twenty one residents at the end of their postgraduate training spend one year in ambulatory care before completing their training and moving on to private practice. Most had already trained two to four years in inpatient internal medicine. Twelve clinical supervisors supervised their work through: one hour of supervision per half-week (protected time in the schedule to discuss the clinical cases of the day) and immediate and unplanned interventions for more urgent clinical situations.

We developed our tool including all the clinical teachers (12) of our general internal medicine outpatient clinic. The observation tool aims at assessing the clinical teaching skills during an encounter between the resident and his supervisor.

### 2.6. Development of the tool

The process of action research is often described as a spiral constituted by several reflective cycles, alternating between observations-actions and evaluation-validation processes.

The different steps of this process were organized within a period of one year: each step was carried out collaboratively with the clinical teachers and represented a reflective and iterative cycle until data saturation was reached.

As a first step and based on the results of the literature [9–11,13,15,16] and in collaboration with the clinical teachers we defined a list of tasks covering the various identified components of clinical teaching skills in an outpatient supervision session (see Fig. 3).

In order to avoid the observer's subjectivity and to increase reliability and objectivity, we chose as second step to develop a descriptive standardized scoring form to be used as a formative assessment tool. This tool contains the criteria for evaluation, the three levels of competence for each criterion and, for each level of competence, a descriptor defining the expected observable behavior (Fig. 4).

### 2.7. Usability, content and construct validity

The definition of the descriptors was then elaborated on the basis of observed and recorded real life clinical teaching sessions brought by the twelve clinical teachers and analysed together once a month over eight months. This qualitative and collaborative approach allowed the wordings of the descriptors to be refined.

In order to ensure further content and construct validation, experts in medical education (JS MN and DC) working in different settings iteratively reviewed the tool and checked that the criteria,



## Observation and learning tool for clinical supervision

Name :

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The supervisor	Level X (low-weak) : makes the learning unpredictable	Level Y (mean-good): has good teaching skills to enhance learning	Level Z (very good): has excellent teaching skills to enhance learning
<b>Step 1 : organises the supervision</b>			
1. Welcomes the resident	⊖ does not put the resident at ease and concentrates on the clinical problem	⊕ welcomes the resident and expresses his availability	⊕⊕ assures adequate time and space or suggests arrangements to put at ease
2. Drives the supervision according to the resident's needs	⊖ listens to the case presentation without asking the resident's own question or needs to drive the supervision	⊕ let the resident express the problem that prevents him to solve the case (before or just after the case presentation )	⊕⊕ clarifies/reflects what prevents the resident to solve the case (learning needs) (before or just after the case presentation ) or discusses the case aiming explicitly at the resident's needs
<b>Step 2: helps the resident to learn from the case</b>			
3. Discusses the case and explores a. the clinical reasoning  b. the underlying medical knowledge  c. the relevant psychosocial elements and patient's perspective	⊖ a. interrupts the resident so as to get more informations following his own medical reasoning or thinks aloud without implying the resident  ⊖ b. questions/explains theoretical notions without clear link with the case or does not discuss any related knowledge  ⊖ c. does not question or underline psychosocial context or patient's perspective relevant to solve the problem	⊕ a. asks the resident what hypotheses has driven his reasoning Or speaks aloud involving the resident  ⊕ b. teaches the knowledge related to the missing notions or wrong interpretations of the resident  ⊕ c. questions or underlines the relevant psychosocial or patient's perspective details	⊕⊕ a. encourages the resident to argue or complete the hypotheses of his medical reasoning  ⊕⊕ b. stimulates the resident to remember the relevant knowledge , or helps to find relevant missing knowledge (gives tools/references )  ⊕⊕ c. underlines the link between patient's perspective or psychosocial elements and the relevance for the problem solving or values when the resident is taking it into account
4. Teaches or corrects a. the history taking or clinical exam  b. an interpersonal/communicational skill  c. a technical skill (technical procedure, venous puncture, joint puncture, stitching, etc)	⊖ a. tells what the resident should do without explanation nor modeling Or does not teach the history taking or clinical exam  ⊖ b. tells what the resident should do without explanation nor modeling or does not teach interpersonal skills  ⊖ c. tells what the resident should do without explanation nor modeling or does not teach technical skills	⊕ a. teaches history taking or clinical examination by explanation or modeling  ⊕ b. teaches relevant interpersonal /communicational skills by explanation or modeling  ⊕ c. teaches relevant technical skill by explanation or modeling	⊕⊕ a. lets the resident demonstrate a skill of history taking or clinical examination  ⊕⊕ b. lets the resident demonstrate an interpersonal/communicational skill  ⊕⊕ c. lets the resident demonstrate a technical skill
5. Discusses the plan : a. developing an action plan  b. adapting the action plan to the patient's psychosocial context and individual perspective  c. verifying the strategies of application	⊖ a. after the diagnosis or definition of the problem, tells the resident what to do  ⊖ b. does not take the psychosocial context (nor the patient's perspective) into account when defining the action plan  ⊖ c. does not check the residents strategies of application or tells the action plan to the patient without discussing it with the resident	⊕ a. asks the resident to express an action plan (investigations, treatment and follow up) or expresses action plan involving the resident  ⊕ b. encourages the resident to take into account the patient's psychosocial context and perspective when defining the action plan  ⊕ c. asks the resident if he feels confident to apply the action plan (the « what ») or offers help for the application of the action plan (to go with him to see the patient)	⊕⊕ a. asks the resident to argue and discuss own action plan  ⊕⊕ b. values an action plan that takes into account the patient's psychosocial context or perspective or stresses the importance to take it into account so as to improve the treatment  ⊕⊕ c. checks how the resident will apply the action plan Or makes a role play
6. Addressing own limits of knowledge	⊖ Expresses no doubt about the medical knowledge	⊕ expresses the limits of his own knowledge or his doubts	⊕⊕ expresses the doubts or limits of his knowledge and defines with the resident a way to find the needed information to overcome the doubts
<b>Step 3 : Ends the supervision</b>			
7. States : a. strengths /what is mastered  b. new learning  c. what has to be learned	⊖ a. does not value or reflect on residents strengths that helped him to solve the problem  ⊖ b. does not speak about what should be remembered  ⊖ c. does not speak about what should be learned on behalf of the discussion	⊕ a. stresses the residents strengths that helped him to solve the problem and values them ⊕ b. tells the resident what he should remember  ⊕ c. suggests some ideas to enhance his ongoing learning	⊕⊕ a. encourages the resident to reflect on own strengths before valuing them  ⊕⊕ b. asks the resident what he will remember and can add some suggestions (or asks for some transfer to other case) or asks the resident for some general principle/rules that can be deduced from present case  ⊕⊕ c. defines with the resident a learning plan (actions, literature, timing, evaluation)
8. Evaluation of supervision process	⊖ does not speak about the supervision process	⊕ checks if supervision has answered his learning needs (content)	⊕⊕ checks if supervision has answered the learning needs and if supervision process is adequate or asks for suggestions of improvement in supervision process

Fig. 5. teaching skills assessment tool.

descriptors and their wording were consistent with recommended teaching guidelines, a learner-centered process as well as the teaching of a patient-centered approach.

### 2.8. Interrater reliability

We then sought to define the interrater reliability of the instrument when used to assess a set of learner-teacher encounters.

Based on previous similar studies, we video-taped thirty learner-teacher encounters, i.e., ten different clinical teachers going through three different clinical teaching sessions with simulated learners (predefined scripts) [45,62,63]. These clinical teachers, with various teaching experiences (one to twelve years) had been trained during a five-session faculty development program on teaching skills.

We then asked ten other clinical teachers from outside the institution to assess these teaching encounters using the developed tool. Ambiguous items with low interrater agreement requiring further refinement were thus able to be detected. This process was led by three senior clinical teachers (NJ, MN and JS) during a consensus meeting leading to adjustments of the tool and its user's guide. The three senior teachers then independently coded the thirty teaching encounters to assess interrater reliability (Kendall's coefficients,  $p$  significant if  $<0.05$ ).

## 3. Results

### 3.1. The assessment tool

This assessment tool consists of (see Fig. 4) three columns defining the level of mastery (A), sixteen lines defining the observed quality criteria (B) and descriptors (C): for every criteria and at each level of competence, the expected observed behavior is described telling the observed trainer what he did and what he could do so as to improve his performance.

The different teaching skills (criteria) are listed in a form respecting the structure of a teaching session (Fig. 5).

Although the use of the assessment tool was not formally assessed, the ten clinical teachers who tested the tool did not report any difficulty in using it and considered the items to be clear.

### 3.2. Interrater reliability

Regarding interrater reliability (Fig. 6), estimates of Kendall's coefficient of concordance ranged from 0.315 to 0.915 with only five of the sixteen criteria being less than 0.5 ( $p > 0.05$ ). Of the sixteen criteria, eleven demonstrated significant reliability ( $p < 0.05$ ).

## 4. Discussion and conclusion

### 4.1. Discussion

In this study, we developed a teaching skills descriptive observation tool for peer review. Through the research methods and processes used, we emphasised the similarities between the patient-centered approach using the interview structure according to the Calgary-Cambridge model and the learner-centered approach, as we believed that the recognition of these similarities would facilitate the transfer of competencies from the clinician's level to the teacher's role, thereby helping the clinical teachers to more easily master the expected teaching competencies.

### 4.2. Development of the tool

This tool fulfills the need of establishing objective criteria that can be used to give formative feedback to clinical teachers: the observed items can be assessed, and the most important aspects can be integrated in the feedback to the clinical teacher. It enables the peer observer to be active during and after the teaching session. As Steinert noticed, this kind of peer supervision, whereby a seasoned teaching professional assists juniors as they mature in their role, is a major factor contributing to professional identity development [64].

The tool covers different possible teaching skills; however, all the items do not have to be covered in one clinical teaching session. The learning needs of the observed clinical teacher should be defined with him in a collaborative learner-centered way to help him improve his clinical teaching skills. The descriptive perspective of the tool provides clear definitions and concrete suggestions to improve postgraduate clinical supervision skills.

### 4.3. Research methods and processes used

The use of action research with active involvement of all participants through the whole process (developing, testing and refining the tool) helped support the importance of the teaching role within the team of clinical teachers: although this was not formally measured, we observed active and enthusiastic involvement in teaching issues and assumed that this happened as a result of the pedagogical development, the reflective sessions with the team of clinical teachers, and the sharing of a common concept of learner-centered teaching skills similar to the patient-centered approach. It helped reinforce and clarify participant's role as clinical teachers. These observations are consistent with the studies of Stone, who postulates that emphasizing clinical teachers' existing role as teachers (to their patients, to their staff) would increase their confidence and enhance their teacher identity [59]. Feeling part of a community of teachers who share the same views on teaching may also reinforce this identity [7,65].

The collaboration with experts in medical education also had positive effects by helping the clinical teachers to overcome the sense of isolation that they may experience by working alone in different departments and lacking resources and opportunities to exchange experiences.

### 4.4. Study strengths and limitations

The tool is shaped in a descriptive scoring form that can be used for formative purposes in the context of peer supervision and feedback: it gives a precise definition of the expected behaviour for each skill at a given level of competence, and clear suggestions on how to improve a skill at a higher level of competence.

By this validation process eleven of sixteen skills showed a significant interrater reliability.

The strongest interrater reliability concerns six items and primarily covers two areas: teaching based on the learner's needs and patient-centered care.

The five items that did not show a high interrater reliability (4c, 5a, 5c, 6, 8) actually had a high interrater agreement (over 90%) but as they were mostly scored as "not done" these items could not be considered statistically reliable. These items will have to be evaluated again, once clinical teachers are trained to use related teaching skills. By increasing their frequency of observation, interrater reliability may improve. These items involved the teaching of a technical skill; the evaluation of the supervision process; including the management of uncertainty; the development of an action plan; verification strategies for the application of the action plan and the evaluation of the supervision process. This

Inter-rater reliability		
Steps of supervision/item	Kendall's coefficient	p-value
<i>Organises the supervision</i>		
1. Welcomes the resident	0.608	0.007*
2. Drives the supervision according to the resident's needs	0.812	0*
<i>Helps the resident to learn from the case</i>		
3a. Discusses the case and explores the clinical reasoning	0.765	0*
3b. Discusses the case and explores the underlying medical knowledge	0.623	0.005*
3c. Discusses the case and explores the relevant psychosocial elements and patient's perspective	0.854	0*
4a. Teaches or corrects the history taking or clinical exam	0.577	0.013*
4b. Teaches or corrects an interpersonal/communicational skill	0.534	0.029*
4c. Teaches or corrects a technical skill (technical procedure, venous puncture, joint puncture, stitching, etc)	0.315	0.541
5a. Develops an action plan	0.49	0.061
5b. Adapts the action plan to the patient's psychosocial context and individual perspective	0.915	0*
5c. Verifies the strategies of application	0.445	0.121
6. Manages own limits of knowledge	0.32	0.519
<i>Ends the supervision</i>		
7a. States the strengths /what is mastered	0.516	0.039*
7b. States new learning	0.825	0*
7c. States what has to be learned	0.862	0*
8. Evaluates the supervision's process	0.333	0.462

Fig. 6. Interrater reliability.

shows us that these skills have to be further developed in our institution in order to be used in practice and to improve the interrater reliability of these items.

A major limitation is that we do not know whether the use of this kind of tool through peer feedback does improve a clinical teacher's skills and this should be evaluated in the future.

A second limitation is a generalisability/transferability issue. Firstly we developed this tool in an outpatient setting and its possible use in another setting has to be tested or adapted. Secondly the descriptors have been defined in our center according to the mean level of competence. With progression occurring over time, the descriptors of the lower levels might be abandoned, and then a higher level of competence will have to be refined. It would be interesting to evaluate whether the use of such a tool in another educational context with different levels of competence would require changes in the definitions of the descriptors.

The interrater reliability was evaluated by medical experts involved to some extent in the development of the tool. They might have been influenced in the way they understood the descriptors, so intercoder reliability should be checked if this tool is used in another context.

Another limitation is the lack of concurrent validity: as there is no existing formative tool, we couldn't directly compare our tool to an existing scoring form.

## 5. Conclusions

This research enabled us to develop a formative observation tool of learner-centered clinical teaching skills based on the parallel with the teaching of communication skills and the patient-centered method. The content of this tool was validated through an action research process that was focused on clinical teaching skills.



Its interrater reliability was moderate to high for most of the descriptors building the tool. Its strength lies in its objectivity as each descriptor defines the concrete expected teaching behaviour for each level of competence: it helps bridge the gap between theory and practice in the field of pedagogical concepts and emphasizes teaching methods that put the learner and the patient in the center.

### 5.1. Practical implications

The tool can be useful to stimulate peer observation of teaching skills, promote faculty development through dialog and reflection and emphasize the importance of teaching patient centeredness while being learner-centered.

### Conflicts of interest

None.

### Committee of ethics

This research was approved by the committee of ethics of the Geneva Hospital.

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